TOM TORLAKSON
State Superintendent
of Public Instruction

Mathematics Framework and Acceleration to Higher Mathematics

The SBE Guidelines state: include a “discussion of options for middle school acceleration to support Algebra I or Integrated Mathematics I prior to ninth grade that are consistent with other Common Core states.”

Acceleration decision points at middle school—between sixth and seventh grade—and in high school, after grade eight

- Acceleration in middle school
- Doubling up, enhanced pathway, or summer bridge in high school

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Appendix A: Course Placement and Sequences for Higher Mathematics

The CA CCSSM represent a tight progression of skills and knowledge that is inherently rigorous and designed to provide a strong foundation for success in the new, more advanced, **Algebra I and Mathematics I courses that will typically be taken by most students in the ninth grade.**

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Appendix A: Course Placement and Sequences for Higher Mathematics

Students Who NOT May Be Ready for Acceleration

Misplacement is common, with negative **consequences** for students when they are unable to keep pace with the incremental difficulty of mathematics content; students' weaknesses in key foundational areas that support algebra-readiness frequently translate into **substantial difficulty reaching proficiency** in higher-level mathematics while **in high school** (Finkelstein, et al., 2012).

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Appendix A: Course Placement and Sequences for Higher Mathematics

Students Who May Be Ready for Acceleration

…there will still be some students who are able to move through the mathematics quickly. These students may choose to take an **accelerated or enhanced mathematics program beginning in eighth grade (or even earlier)** so they can take college-level mathematics in high school.

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Appendix A: Course Placement and Sequences for Higher Mathematics

Students who are capable of moving more quickly deserve thoughtful attention, both to ensure that they are **challenged** and that they are mastering the full range of mathematical content and skills—**without omitting critical concepts and topics**.

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Appendix A: Course Placement and Sequences for Higher Mathematics

…maintaining motivation and engagement in advanced mathematics is essential for some students who enjoy their work in mathematics and excel in mathematics, and in school, as a result. **Slowing down instruction or restricting access to accelerated sequences may discourage and disengage some students** from their progress in math, and potentially other courses as well.

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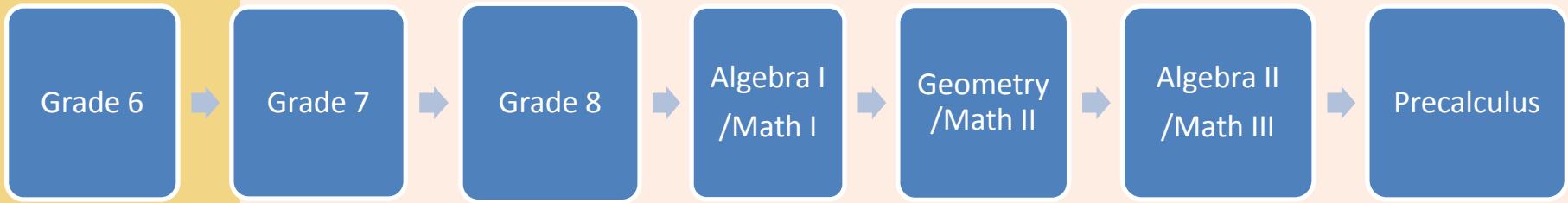
Course Sequences for Higher Mathematics: No Acceleration



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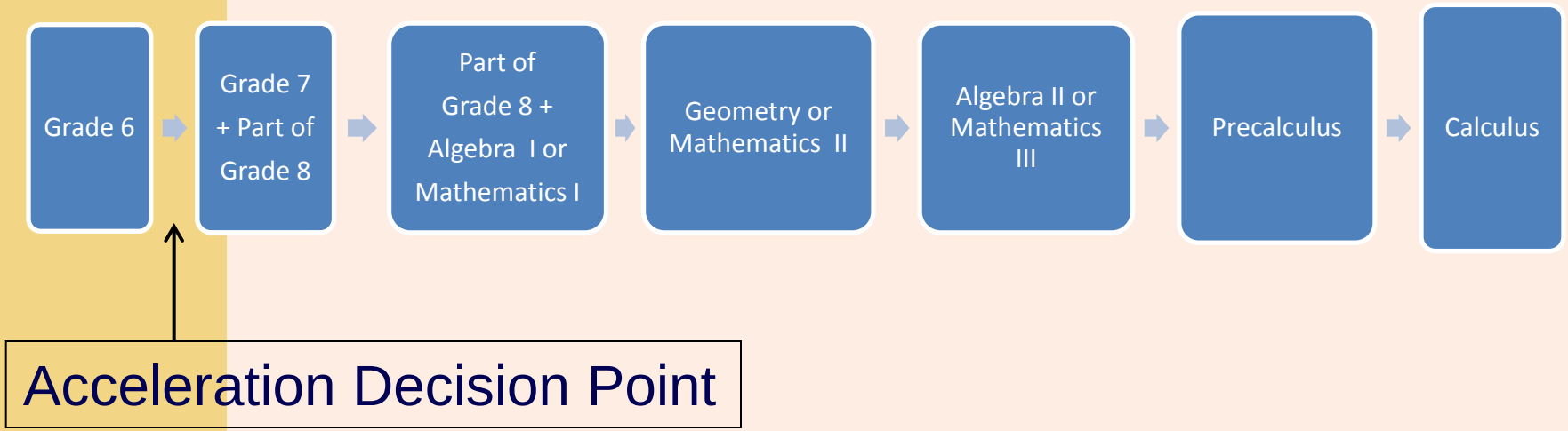
Course Sequences for Higher Mathematics: Middle School Acceleration



Course Sequences for Higher Mathematics: Doubling Up

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Doubling up in High School

Grade 6 → Grade 7 → Grade 8 → Algebra I → Algebra II → Precalculus → Calculus

Geometry

Acceleration Decision Point

Accelerated Integrated Pathway

Grade 6 → Grade 7 → Grade 8 → Mathematics I and part of Mathematics II → Part of Mathematics II and Mathematics III → Precalculus → Calculus

Course Sequences for Higher Mathematics: Enhanced & Summer Bridge

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State Superintendent
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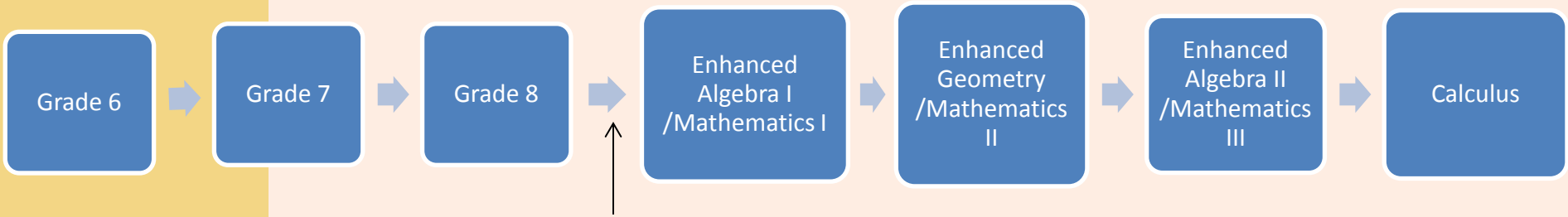
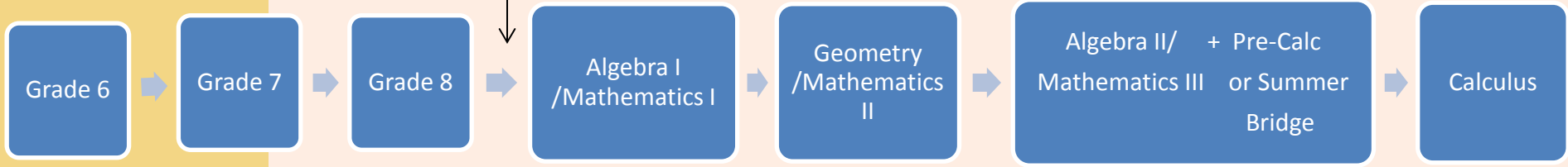
Enhanced Pathway



Acceleration Decision Point

Summer Bridge Pathway



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View the new *Mathematics Framework* online at

http://www.cde.ca.gov/ci/ma/cf/

AUHSD CCSSM Transition

Julie Spykerman
Math Curriculum Specialist
Anaheim Union High School District
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AUHSD CCSSM Transition

Informed, collaborative decision-making

- Math Sequencing Task Force and Math Chairs
- Building Consensus for Implementation Timeline
- Publishers' Forum for Sr. High Curriculum

AUHSD CCSSM Transition

Implementation Timeline

- 2013-14—Grades 7 and 8
- 2014-15—Integrated Math I—replacing 1997 Algebra 1
- 2015-16—Integrated Math II—replacing 1997 Geometry
- 2016-17—Integrated Math III—replacing 1997 Algebra 2
- 2016-17– CCSSM Pre-Calculus Replacing 1997 Pre-Calculus

AUHSD CCSSM Transition

Professional Learning

- Summer Workshops
  - New course Training
  - Standards for Math practices (2013)
- During the School Year
  - Continued training for new courses (Admins invited)
  - CCSSM Pilot Road Trips
- New in 2014-15
  - Sr. High Schools—Math Demonstration Class Teacher
  - Principal/Administrator Road Trips

AUHSD CCSSM Transition

Common Core Math Materials

- Partnership with UCI Math Project (IMP) for Grades 7 and 8
- Carnegie Learning Common Core Integrated Math Series for Grades 9-12
  - 2013-14—Piloted Integrated Math I in three diverse Sr. High Schools

AUHSD CCSSM Transition

Points of Acceleration

- 9th Grade: Compaction of three years of Integrated Math Pathway into two years
- 12th Grade: into CCSSM PreCalculus Honors (with some Calculus topics)
- 12th Grade: AP Calculus BC after CCSSM PreCalculus Honors

REACH HIGHER shasta | EVERY STUDENT EVERY OPTION

Chris Dell, Director of K-12 Math & Technology
Judy Flores, Assistant Superintendent of Instructional Services

Mission: Working together as a community to provide all students with all options for education and training after high school to pursue a successful, fulfilling career.

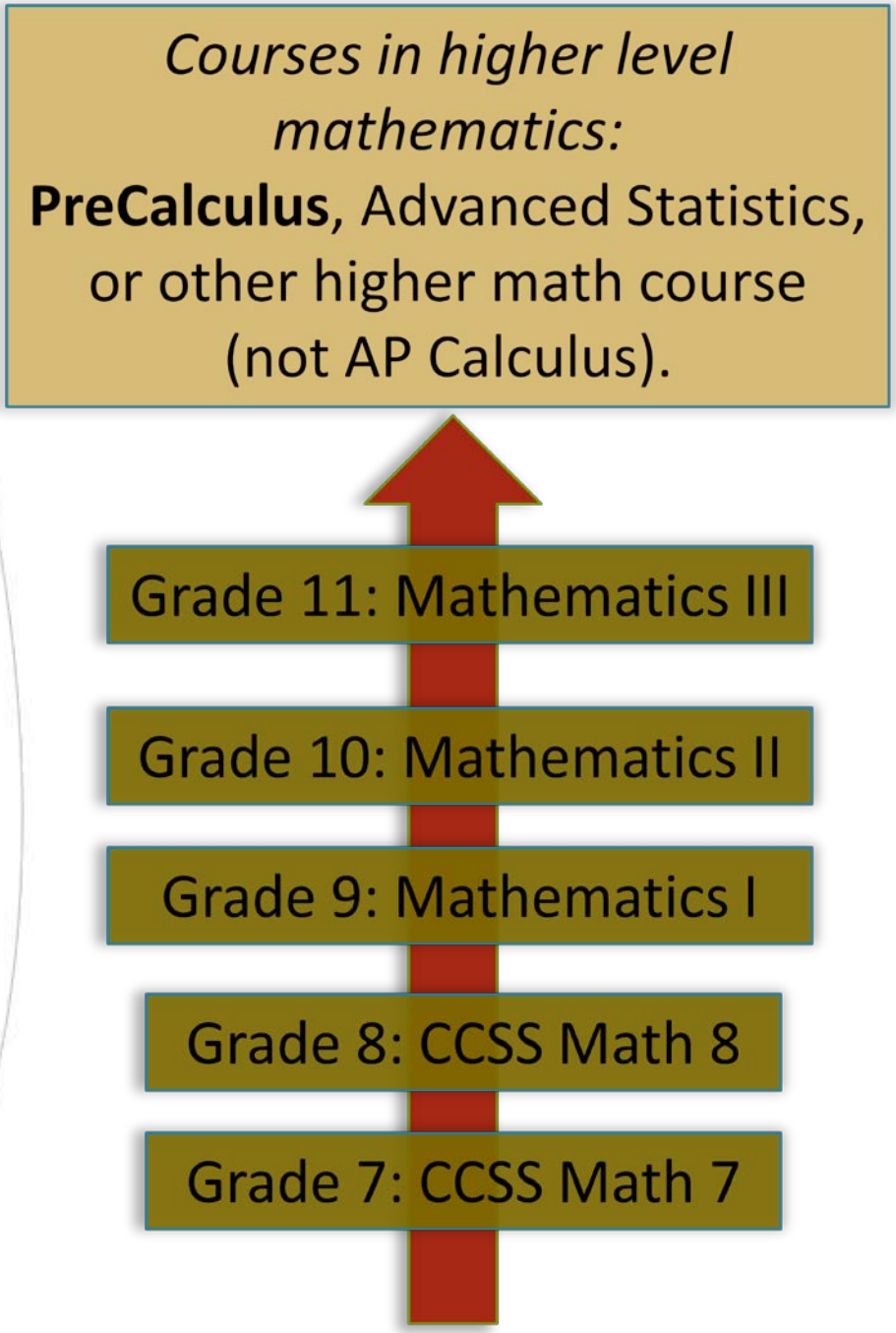
- 2010-11: REACH HIGHER Shasta Initiative
- 2011-12: Math Task Force; 8th grade focus
- 2012-13: High School Integrated Pathway
  - Articulation with Middle School; Acceleration plan
- 2013-14: HS Integrated Math 1 (& Math 2)
  - Curriculum Discussion; Articulation with MS

High Schools Collectively chose the CCSSM Integrated Course pathway

- The integrated high school course pathway is a more balanced presentation of the material over the 3 year program than the traditional alg-geo-alg approach.
- Linear and Exponential functions (no quadratics) focus in Math 1 is mathematically coherent.
- Consistent with the focus and coherence of K – 8 mathematics content
- CC Algebra 1 ≠ 1997 CA Algebra 1 , etc. (less parent/teacher misconceptions)
- Life is integrated.

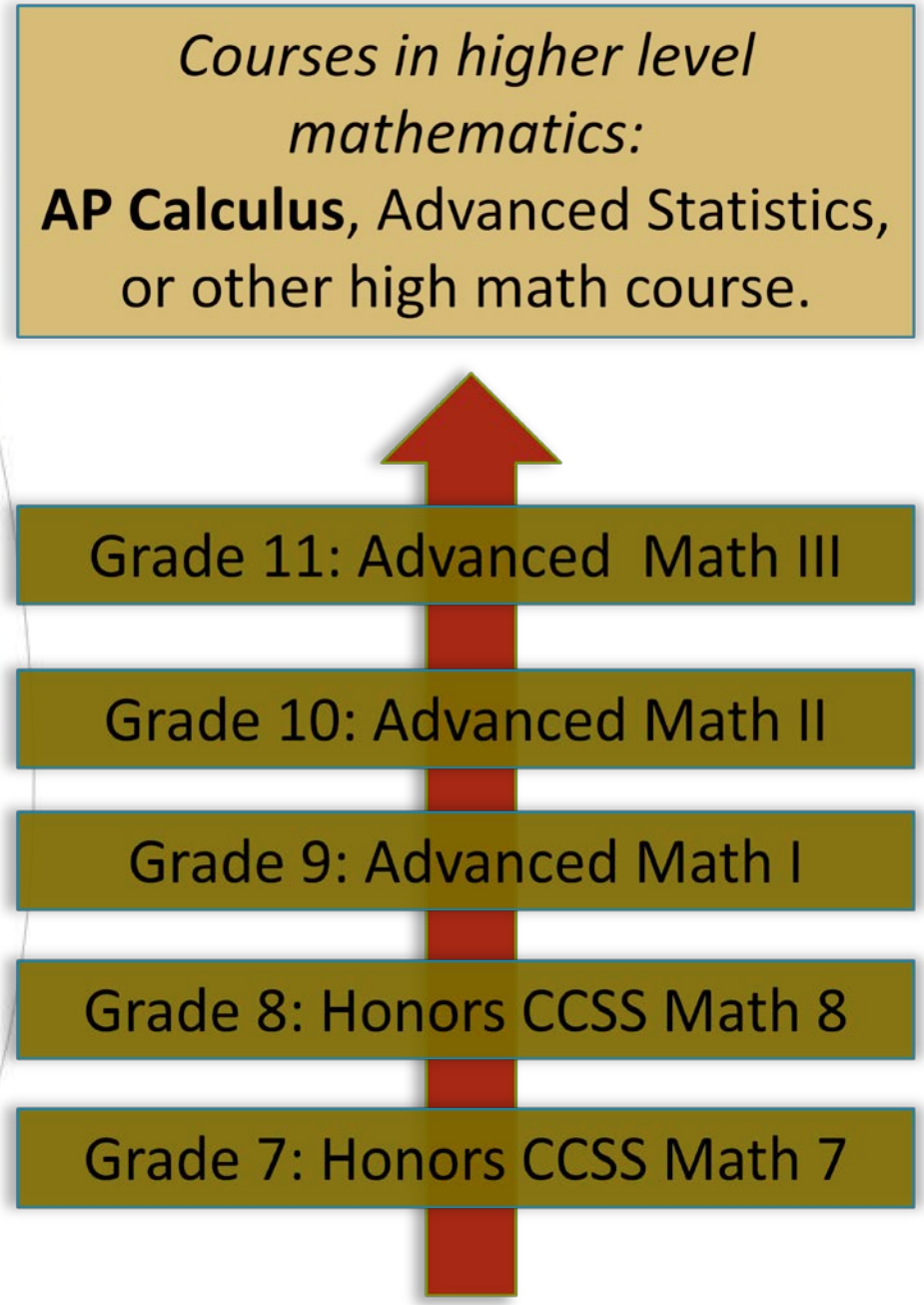
The MS & HS Math **grade level** integrated course pathway

- This approach is typically seen internationally (Integrated) that consists of a sequence of three courses, each of which includes number, function, algebra, geometry, probability and statistics



MS & HS Math **Honors** integrated course pathway

- The three grade level HS integrated pathway courses that also includes the CCSS plus (+) standards (PreCalculus Standards) appropriately aligned to each conceptual cluster and distributed *evenly* among the three courses.
- The MS honors courses are cover the same content standards as defined in the CCSSM for grade 7 & 8, but with greater depth and more emphasis on higher cognitively complex tasks.



Continued CCSSM Collaboration and Support

- Articulation with Middle and High School teachers
  - Instructional Resources, Modeling, Teaching the Why & Where before the How, Assessment, Placement, etc.
- Focus sessions for teaching math for conceptual understanding and procedural fluency.
- Integrated High School Honors course development
  - Aligning the Precalculus standards with the Math 1, 2 & 3 course standards.

REACH HIGHER shasta | EVERY STUDENT EVERY OPTION

Successes and Challenges

- Successes
  - "Integrated" allows for shift from the How to Why and Where
  - Relevance; problem solving tasks
- Challenges
  - Transfer students; gaps in learning
  - Teachers not knowing how to implement instructional strategies to best align to standards and SMPs: Dependence on curriculum
  - Parent communication
- Both: Reading, writing and collaboration in the math class

REACH HIGHER shasta | EVERY STUDENT EVERY OPTION

Mathematics Pathways

Presentation to the State Board of Education
July 10, 2014

Long Beach Unified School District

Traditional Sequence
With Compacted Option

Rationale and considerations:

- Teacher leader feedback (Science, Math)
  - STEM pathway preparation/support
  - Familiar organization amidst dramatic change in content and pedagogy
  - Teachers not having 'deep knowledge' in *all* areas
  - Discrete approach facilitates laser focus and deeper exploration and connection to other contexts

Instructional Resources

- District-developed CCSS Scope and Sequence documents
- District-developed CCSS Unit Guides with SBAC-aligned assessments
- Current core adoption (2008) – CA HSP, Holt
- CCSS-aligned supplemental resources:
  - *Early Mathematics: A Resource for Teaching Young Children*, The Charles A. Dana Center at the University of Texas at Austin, 2012
  - *California Common Core Math*, Houghton Mifflin Harcourt, 2013
  - *Explorations in CORE Math for Common Core*, 2013

Professional Development

- 2012-13: K-12 Trainer of Trainers delivery: instructional shifts, CCSS-aligned 'drop-in' units, formative assessment modules
- 2013-14: K-12 Face to Face delivery: new CCSS-aligned curriculum units, standards/practices study, instructional strategies (9 hours required)
- 2014-15: K-12 Face to Face delivery: new curriculum units, standards/practices study, balanced assessment (18 hours required)
- 2015-16: K-12 Face to Face delivery: new instructional resources (core text adoption), standards/practices study, balanced assessment (18 hours required)
- 2016-17: K-12 Face to Face topic-based (teacher choice)
- Communities of Practice at K-12 school sites

Acceleration Options

- Accelerated (compacted) Math 6
- Accelerated (compacted) Math 7
- Algebra I in grade 8

late entry via summer (2015) bridge support

- Accelerated and Honors courses – high school

Implementation Challenges

- Deepening teacher content knowledge
- Continuing need to *focus* course content
- Availability of aligned core textbooks (2014-15 adoption cycle)
- Parent reluctance to embrace CCSS Math 8 course

Davis Joint Unified School District

Clark Bryant, Associate Superintendent, Instructional Services

- Process for Program Development
  - Elementary
  - Junior High Schools
  - High Schools
- Acceleration Points
  - Caring for Students
  - Identification
- Professional Development
  - Local Expertise
  - SCOE/YCOE
  - UCD Math Project
- Instructional Resources
- Challenges
  - Gaps in Expectations
  - Communication